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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/765,768	01/18/2001	Kevin G. Ewsuk	SD6641/S95450	9750
20567	7590	02/04/2005	EXAMINER	
SANDIA CORPORATION P O BOX 5800 MS-0161 ALBUQUERQUE, NM 87185-0161			SHAAWAT, MUSSA	
			ART UNIT	PAPER NUMBER
			2128	

DATE MAILED: 02/04/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/765,768

Applicant(s)

EWSUK ET AL.

Examiner

Mussa A Shaawat

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 27 October 2004.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-8, 10, 12, 13 and 15-18 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-8, 10, 12-13, and 15-18 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

1. This application has been examined.
2. Claims 9, 11, and 14 have been canceled claims 1-8, 10, 12-13, and 15-18 are pending.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 1-7 and 9-18 are rejected under 35 U.S.C. 103(a) as being unpatentable over K. E. Carr et al ("PCS ELITE – A complete Die Compaction Software Package", 1999), herein referred to as Carr and in view of Applicant's Own Admission (specification page 4, lines 3-4, page 5, line 17).

5. As per claim 1 Carr discloses generating a primary geometry of a component to be formed by powder pressing using a computer program through a user interface wherein the primary geometry is developed using a combination of predefined axisymmetric geometric shapes (page 10-115 paragraph 3, "the geometries of drawing element such as vertices, lines, and arc i.e. predefined geometrical shapes ... and powder shape") and transition radii to simulate said primary geometry, said predefined axisymmetric geometric shapes having variable dimensions (Abstract; page 10-112, 6th paragraph; page 10-114, 1st paragraph and figure 4; page 10-115, 1st and 2nd

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paragraphs; applicant's own admission in the specification teaches the transition radii; page 10-118, figure 8; page 10-119, 1st paragraph);

developing a finite element mesh representing said primary geometry; said finite element mesh generated automatically and internally through said computer program (page 10-115, 4th paragraph, the assemble component of the PCS Elite program has the capabilities and functionality necessary to assemble and define a complete compaction model which includes defining boundary conditions, assigning material properties and creating finite element meshes i.e. generating finite element meshes through the use of a program);

defining pressing boundary conditions (page 10-115, 4th paragraph); defining powder and powder material properties to be pressed (page 10-116, 1st and 3rd paragraphs; page 10-117, 1st paragraph);

calculating deformation characteristics of said powder and primary geometry using a deformation, nonlinear, quasi-static finite element code (page 10-111, 2nd paragraph; all of page 10-120 and 121; applicant's own admission in the specification teaches deformation, nonlinear, quasi-static finite element code); evaluating said deformation characteristics to determine the acceptability of said primary geometry (all of page 10-120 and 121).

6. As per claim2, Carr discloses modifying said primary geometry, said powder material properties of said component and said pressing boundary conditions to form a component geometry (page 10-115 3rd paragraph; page 10-116 1st and 3rd paragraphs; page 10-117, 1st paragraph; page 10-119, 1st paragraph and figure 9).

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7. As per claim 3, Carr discloses cylinder an axisymmetric geometric shape (page 10-112, 6th paragraph). Carr fails to disclose cones, toroids, spheres, parallelepipeds, ellipsoids, and polyhedrons. It would have been obvious to one of ordinary skill in the art at the time the invention was made to develop different axisymmetric geometric shapes for simulation.

8. As per claim 4, Carr discloses a metal powder (page 10-112, 6th paragraph; page 10-117, figure 7). Carr fails to disclose a ceramic powder, a pharmaceutical powder, a plastic powder and mixtures thereof. It would have been obvious to one of ordinary skill in the art at the time the invention was made to use different powders for simulation.

9. As per claim 5, Carr discloses development of finite element mesh and calculation (page 10-117, 2nd and 3rd paragraphs). Carr fails to disclose that the calculations are performed in less than 60 minutes. It would have been obvious to one of ordinary skill in the art at the time of invention was made to perform calculations in less time for better and efficient simulation.

10. As per claim 6, Carr discloses development of finite element mesh and said calculation of the deformation characteristics are performed on a personal computer (page 10-117; 1st and 2nd paragraphs; page 10-118, figure 8; page 10-119, figure 9; all of page 10-120; page 10-121, figure 11).

11. As per claim 7, Carr discloses finite element mesh represents a two dimensional primary geometry (page 10-115, 3rd paragraph; page 10-118, figure 8; page 119, figure 9).

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12. As per claim 10, Carr discloses the primary geometry is the design forming a die (page 10-111, abstract; page 10-111, 5th paragraph; page 10-112, 6th paragraph).

13. As per claim 12, Carr discloses the primary geometry is generated with the aid of a graphical user interface on a computer (page 10-111, abstract; page 10-114, 1st paragraph and figure 4; page 10-115, 1st and 2nd paragraphs).

14. As per claim 13, Carr discloses step of generating the primary geometry uses said axisymmetric geometric shapes selected from a menu of axisymmetric shapes interactively selected with the aid of a graphical user interface on a computer (page 10-114, 1st paragraph and figure 4; page 10-115, 1st and 2nd paragraphs).

15. As per claim 15, Carr discloses primary geometry is generated with the aid of a graphical user interface on a computer using physical dimensions from a finished part (page 10-112, 6th paragraph; page 10-113, figure 1; page 10-114, 1st paragraph, figure 4).

16. As per claim 16, the primary geometry is generated with the aid of a graphical user interface on a computer whereby the geometric shapes used to construct the primary geometry are selected from a display menu on a computer screen (page 10-115, 1st paragraph, figure 4; page 10-115, 1st, 2nd, and 3rd paragraphs, figure 5).

17. As per claim 17, Carr discloses generating a die geometry of a component to be formed by powder pressing using a computer program wherein the die geometry is developed using a combination of predefined axisymmetric geometric shapes (page 10-115 paragraph 3, "the geometries of drawing element such as vertices, lines, and arc i.e. predefined geometrical shapes ... and powder shape"), transition radii, and

transition spaces to simulate said primary geometry, said axisymmetric geometric shapes having variable dimensions, said predefined axisymmetric shapes; (page 10-111, abstract; page 10-112, 6th paragraph; page 10-114, 1st paragraph and figure 4; page 10-115, 1st and 2nd paragraphs; applicant's own admission in the specification teaches the transition radii, transition spaces are inherent in different geometric shapes; page 10-119, 1st paragraph), Carr discloses cylinder (page 10-112, 6th paragraph);

Developing a finite element mesh representing said die geometry, said finite element mesh generated automatically and internally through said computer program (page 10-115, 4th paragraph, the assemble component of the PCS Elite program has the capabilities and functionality necessary to assemble and define a complete compaction model which includes defining boundary conditions, assigning material properties and creating finite element meshes i.e. generating finite element meshes through the use of a program).

defining pressing boundary conditions (page 10-115, 4th paragraph); defining a powder and powder material properties to be pressed in said primary geometry, said powder selected from a ceramic powder, a metal powder, a pharmaceutical powder, a plastic powder and mixtures thereof. Carr discloses a metal powder (page 10-112, 6th paragraph; page 10-117, figure 7).

Carr fails to disclose a ceramic powder, a pharmaceutical powder, a plastic powder and mixtures thereof. It would have been obvious to one of ordinary skill in the art at the time the invention was made to use different powders for simulation; calculating deformation characteristics of said powder and die geometry using a

deformation, nonlinear, quasi-static finite element code (page 10-111, 2nd paragraph; all of page 10-120 and 121; applicant's own admission in the specification teaches deformation, nonlinear, quasi-static finite element code); evaluating said deformation characteristics to determine the acceptability of said die geometry (all of page 10-120 and 121).

18. As per claim 18, Carr discloses minimizing the computational time (page 10-117, 3rd paragraph). Carr fails to disclose that calculations are performed in less than 60 minutes. It would have been obvious to one of ordinary skill in the art at the time of invention was made to perform calculations in less time for better and efficient simulation.

19. Claim 8 is rejected under 35 U.S.C. 103(a) as being unpatentable over K. E. Carr et al ("PCS ELITE – A complete Die Compaction Software Package", 1999), herein referred to as Carr and in view of Applicant's Own Admission (specification page 4, lines 3-4, page 5, line 17) and in further view of H. Zipse ("Finite Element Simulation of the Die Pressing and Sintering of a Ceramic Component", 1997), herein referred to as Zipse.

20. As per claim 8, Carr fails to disclose said finite element mesh represents a three-dimensional primary geometry. H. Zipse teaches the three-dimensional geometry (page 1709, figure 4; page 1710, figure 5). It would have been obvious to one of ordinary skill in the art at the time of the invention was made to modify the teachings of Carr with Zipse to learn about the density distribution in the final product.

Response to Arguments

21. Applicant's arguments filed have been fully considered but they are not persuasive.

In the remarks, the applicant argues in substance that; A) Carr does not disclose a user interface that requires less interaction from the user, the user is not required to be an expert in finite element modeling which would significantly reduce the time required to do prepare the simulation; B) Carr does not disclose predefined geometric shapes and finite element meshes generated through a computer program.

A) Applicant argues Carr does not disclose a user interface that requires less interaction from the user, the user is not required to be an expert in finite element modeling which would significantly reduce the time required to prepare the simulation, these limitations are not found in the claims. Claimed subject matter not the specification is the measure of the invention. Disclosure contained in the specification cannot be read into the claims for the purpose of avoiding prior art. In re Sporck, 55 CCPA 743, 386 F.2d 924, 155 USPQ 687 (1986); In re Self, 213 USPQ 1, 5 (CCPA 1982); In re Priest, 199 USPQ 11, 15 (CCPA 1987).

In response to B) Carr teaches CAD component is used to create two different types of features: geometric and profiles; geometries are a collection of drawing elements, such as vertices, lines, and arcs i.e. predefined geometric shapes (Page 10-115 paragraph 3). Furthermore Carr teaches an assembly component of the PCS Elite program, that provides all the capabilities and functionality necessary to assemble and define a compaction model which includes positioning part and tooling pieces, assigning material properties, creating finite element meshes, and defining boundary conditions

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(Page 10-115 paragraph 4). Therefore Carr meets the scope of the claimed limitation "predefined geometric shapes and finite element meshes generated through a computer program".

22. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Conclusion

23. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

- Weiss et al (US 4,912,664), Method and apparatus for generating a mesh for finite element analysis.
- Pento (US 5,517,871), Procedure for simulating tablet compression.

Communications

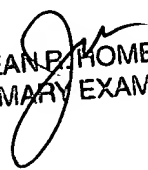
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24. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Mussa A Shaawat whose telephone number is (571) 272-3785. The examiner can normally be reached on Monday-Friday (8:30am to 5:00pm).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jean R Homere can be reached on (571) 272-3780. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Mussa Shaawat
Patent Examiner
January 26, 2005


JEAN R. HOMERE
PRIMARY EXAMINER